

The specification discloses several species of wild-type *Chrysosporium* (Table 12, p. 37), and neutral and/or alkaline cellulases derived therefrom, as well as a mutant *Chrysosporium* (example 14, p. 70) and neutral and/or alkaline cellulases made therefrom. Applicants respectfully submit that this disclosure would reasonably convey to one of skill in the art that Applicants had possession of the invention as claimed in claims 2, 4, and 83. This is so because one of skill in the art would recognize that *Chrysosporium* fungi are capable of producing the neutral and/or alkaline cellulases of the invention, regardless of whether the fungi are wild-type or mutant. *Chrysosporium* fungi having mutations not related to cellulase structure, in particular, would be recognized as capable of producing wild-type cellulases that were in the possession of the inventors, and adequately described within the meaning of 35 USC 112.

Accordingly, Applicants respectfully submit that the specification provides adequate written description for claims to cellulases from both wild-type and mutant *Chrysosporium*. The specification also conveys to the artisan how to obtain a cellulase from either a wild-type or mutant *Chrysosporium*.

In view of the above observations, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 2, 4, and 83 on these grounds.

The Examiner contends that claims 24, 36, 46, and 52 are "directed to all possible nucleic acid sequences" from *Chrysosporium*, and that these nucleic acid sequences are not sufficiently described in the specification. Applicants respectfully point out that these claims are directed not to nucleic acids, but to compositions comprising cellulases. It is an element of these claims that the cellulases are encoded by nucleic acid sequences from *Chrysosporium*. The language of these claims serves to specifically point out and distinctly claim the invention: by defining the cellulases in terms of the source of their encoding DNA, it puts the public on notice that a neutral and/or alkaline *Chrysosporium* cellulase remains within the scope of the claims even if the encoding nucleic acid sequences have been removed from *Chrysosporium* and the cellulase is expressed in vitro or in another host cell or organism. In view of these observations, Applicants respectfully request reconsideration and withdrawal of the rejection of claims 24, 36, 46, and 52 on these grounds.

The Examiner contends that claims 80-82 are "directed toward all possible methods for generating mutant strains of the genus *Chrysosporium*." The Examiner notes that the specification provides radiation and three chemical mutagens as examples, but contends that these are not enough species to support a claim to the entire genus of mutagenesis methods. Applicants first point out that claims 81 and 82 are limited to the specifically exemplified mutation techniques of radiation and chemical mutagenesis. Reconsideration and withdrawal of the rejection of claims 81 and 82 is requested for this reason.

Regarding claim 80, Applicants next respectfully note that in addition to the above mutagenesis methods, oligonucleotide directed mutagenesis, linker scanning mutation, and PCR methods are provided as alternatives (p. 18 lines 23-26), and reference works on the subject are identified. One of skill in the art would understand that all mutation methods produce the same physical result, namely a mutation in the DNA of the *Chrysosporium* organism. Thus Applicants respectfully submit that claim 80, which recites "mutating spores of a fungus" as one of three steps, is adequately supported in its full scope. Furthermore, the claim is not "directed toward all possible methods for generating mutant strains of the genus *Chrysosporium*" but specifically recites additional culturing and screening steps that further limit the scope of the claim. In view of these observations, applicants submit that one of skill in the art would have concluded that Applicants had possession of the entire subject matter of claim 80 at the time of filing. Reconsideration and withdrawal of the rejection of claim 80 on these grounds is respectfully requested.

The Examiner rejects claims 2-66 on the grounds that the specification "does not reasonably provide enablement for any mutant cellulase from any mutant fungus of the genus *Chrysosporium*." The Examiner refers to the "Wands factors" by which undue experimentation is to be determined.

The Examiner states that "The nature and breadth of the claims encompass any mutant cellulase from any mutant fungus of the genus *Chrysosporium*." The Examiner then states that "[t]he amount of experimentation to determine the specific mutation in the amino sequence of the claimed cellulase is enormous."

Applicants note that claims 2-66 are not directed to "mutant cellulases", as the Examiner characterizes them, but are directed to cellulases from *Chrysosporium* where the *Chrysosporium* organism may (or may not) be a mutant. Applicants note that the phrase "wild-type or mutant" is recited, or implicit, in every claim but claims 4 and 6. The phrase "wild-type or mutant" is not so much a limitation as a clarifying term, serving notice that the term "*Chrysosporium*" in the claims is meant to encompass all fungi of the genus, whether mutant or not. The phrase also provides the antecedent basis for "mutant" in claims 4 and 6.

Applicants respectfully submit that the specification reasonably provides enablement for any neutral and/or alkaline cellulase from any *Chrysosporium* species, whether the organism is mutant or wild-type, for the reasons set forth above: one of skill in the art would recognize that both wild-type and mutant *Chrysosporium* are capable of producing the neutral and/or alkaline cellulases of the invention. It would be apparent to the person of ordinary skill that mutant *Chrysosporium* species (especially where the mutation is not in a cellulase-encoding gene) would produce the very same cellulases that were in the "possession" of the inventors, and adequately described within the meaning of 35 USC 112. Even mutants having altered levels of cellulase expression or secretion would still produce the wild-type cellulases of the invention.

Applicants respectfully submit that the disclosure of the specification (examples of mutants of one species, and cellulases therefrom, together with teaching of how to mutate the others) "reasonably provides enablement" of mutant *Chrysosporium* and cellulases therefrom. In view of the foregoing remarks, reconsideration and withdrawal of the rejection of claims 2-66 on these grounds is respectfully requested.

Finally, the Examiner rejects claims 80-82 because the specification allegedly "does not reasonably provide enablement for any mutagenic method for generating mutant strains of the genus *Chrysosporium* with enhanced cellulase activity at neutral and/or alkaline pH." The Examiner refers to three of the "Wands factors" by which undue experimentation is to be determined, and Applicants address the factors as follows:

(a) quantity of experimentation necessary. The Examiner states that "the amount of experimentation to determine the specific mutagenic method for making the claimed fungal

strain is enormous," and goes on to recite such steps as isolating the cellulase, preparing DNA libraries, obtaining DNA sequences, mutating the DNA, and expressing the mutant DNA in host cells.

Applicants readily concede that the process recited by the Examiner represents a great deal of work, but the plain language of claim 80 reveals that none of these steps are necessary to practice the invention. According to claim 80, only three steps are required: spores are mutated (simple exposure to radiation or chemicals are the exemplified embodiments), spores are cultured, and cultures are screened. The screening can be done by visual inspection of cleared zones around the cultured colonies, if they are grown on cellulose agar plates (specification pp. 21-22, and especially example 14, p. 70), or the practitioner can screen more quantitatively by well-established colorimetric assays (specification, p. 20). There is no requirement that a cellulase or DNA be isolated or manipulated in any way. Applicants respectfully submit that the fact that a practitioner might choose to carry out the claimed process in a more complex manner, in order to employ advanced molecular biological techniques, does not mean that the claimed process requires undue experimentation. Furthermore, if one were to employ the methods described by the Examiner, such experimentation would not necessarily be undue.

(b) the amount of direction or guidance provided. The Examiner "finds that one skilled in the art would require additional guidance, such as information regarding the specific mutagenic method used to make the mutant fungal strain having enhanced neutral and/or alkaline cellulase activity." Applicants respectfully note that such guidance is not necessary. One skilled in the art, in order to practice the method of claim 80, need only choose a *Chrysosporium* species and then perform exactly the steps described in the specification: mutation of spores, culturing of spores, and assaying of cultures (p. 70, example 14). Any other mutagenic method may be employed, according to claim 80, and accordingly the practitioner may select any of the routine mutagenesis methods well-known in the art, which are well-known and routine precisely because the specification and the literature provide adequate guidance to those of ordinary skill.

c. The breadth of the claims. The Examiner states that the breadth of the claims encompasses any mutagenic method, including recombinant mutagenic methods. The alleged

complexity of these methods, and the lack of guidance in the specification with respect to these methods, is cited as evidence that the specification is not enabling. Applicants again respectfully submit that the mere fact that there are more complex ways to carry out the claimed process does not mean the invention cannot be practiced without undue experimentation or further guidance. As noted above, simpler methods, with sufficient guidance to carry them out, are taught in the specification.

In view of the above remarks, Applicants respectfully request reconsideration and withdrawal of the rejections of claims 80-83 on these grounds.

CONCLUSION

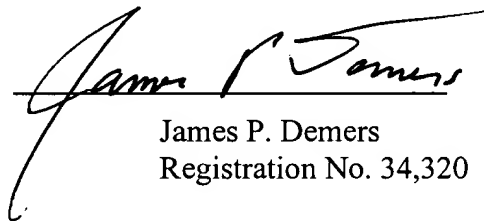
The above remarks are directed to the adequacy of the specification under 35 USC §112, and in making these remarks Applicants are not disclaiming subject matter presently within the scope of the claims. Applicants respectfully submit that these remarks overcome the rejection of claims 2-66 and 80-83 under 35 U.S.C. §112.

Favorable consideration and an action passing this case to issue are respectfully requested. If any questions or issues remain, or if the Examiner has any comments or suggestions for expediting allowance of this application, he is invited to contact the undersigned at the telephone number below.

Respectfully submitted,
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Dated: September 27, 2001

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